Rosemount 3051SMV

MultiVariable™ Mass Flow Transmitter

Engineered for simplicity. Designed for flexibility.

ROSEMOUNT®

EMERSON™
Process Management

Better Measurement. Real Results.

Better measurement is the key to better control. The 3051SMV delivers unprecedented performance and capabilities by integrating MultiVariable measurement into the industry-leading, scalable 3051S platform. The result is better control of raw materials, combustion, reactions, blending and product quality.

Higher productivity

Increase quality and reduce rework with a high performance measurement that doesn't drift over time. With a 10-year stability guarantee and 12-year limited warranty, the reliability of the 3051SMV minimizes maintenance and improves overall productivity.

Enhanced energy management

Effectively track energy production, demand and total usage for steam and natural gas. Our patented, fully-compensated energy flow technology provides accurate, repeatable and reliable measurement of energy for more accurate billing, immediate detection of anomalies that lead to energy loss, and optimization of product throughput and quality during peaks in demand.

Tighter control of reactions

Optimize performance of reactors, distillation columns, adsorption towers and other process units with mass-based control of feed stock. The patented, fully-compensated mass flow calculations in the 3051SMV provide the best accuracy, repeatability and reliability to carefully meter feed stock and other components under changing process conditions.

Improved custody transfer

Improve profitability in custody transfer applications of steam, natural gas and other high value gases and liquids. Not only are the sensors in the 3051SMV more accurate, but our advanced correction capabilities ensure mass flow and energy outputs are optimized.

Tighter combustion control

Optimize combustion in boilers and furnaces through precision measurement of air and fuels. Our patented fully-compensated mass flow calculations update 22 times per second for tighter control in changing process conditions.

Increased environmental protection

Reduce potential fugitive emissions and leak points by up to 70%, for better protection of the environment, while lowering installed costs. Our 3051SMV flowmeters arrive fully configured, leak-tested and ready to install.

Reduced material costs

Minimize production costs by more accurately measuring expensive chemicals and other raw materials. Our Engineering Assistant™ software contains an extensive database of density, viscosity, compressibility and other related fluid properties for over 120 standard fluids, to effortlessly and more accurately ratio your flows.

Intelligence Made Easy

Simplify mass and energy flow with the enhanced software capabilities of the Rosemount 3051SMV. Our advanced compensation techniques provide faster and more accurate calculations. Enter three parameters and we do the rest. No guesswork or complicated calculations are required. The result is effortless flow optimization for tighter control.

Superior software for unequalled performance

Many plants calculate mass flow in a host computer using a simplified mass flow equation. The 3051SMV provides full compensation of over 25 different parameters to achieve a 5x improvement in flow performance compared to uncompensated DP flow.

- Patented Chebychev method efficiently processes data, providing improved accuracy and faster flow updates
  - A 10x dynamic response improvement
  - 22 flow updates per second
- Unsurpassed temperature performance and capability
  - Sensor matching using Callendar-Van Dusen constants
  - User-specified sensor limits for improved temperature diagnostics
- Joule-Thompson correction per ISO and AGA standards
- Multiple outputs including energy flow (using BTU or Joule)
- Built-in totalizer for flow or energy eliminates additional external devices
- Low flow cut-off improves flow totalization

Ease of use improves productivity

Engineering a DP flow device has never been easier. Our Engineering Assistant™ software, with Windows® navigation and graphical interface, enables configuration of the 3051SMV in three easy steps. Start-up and maintenance is further enhanced with Emerson's 375 Field Communicator through real-time access and validation of all flow configuration variables.

- Comprehensive fluids and primary element database
- Instant validation with test calculation
- Compliance with industry standards including API, ISO 5167, AGA Report #3 & #8, and ASME MFC-3M
- Status and quality reported on all process variables for enhanced diagnostics

WE MEASURE
Differential Pressure
Static Pressure
Temperature

WE CALCULATE

Density	Gas Expansion
Velocity	Discharge Coefficient
Viscosity	Velocity of Approach
Beta Ratio	Reynolds Number

YOU ENTER
1. Process Fluid
2. Primary Element
3. Line Size

$$Q_{mass} = C_D E Y_1 d^2 \sqrt{DP\,(p)}$$

YOU RECEIVE
Mass Flow
Volumetric Flow
Energy Flow
Totalized Flow
Differential Pressure
Static Pressure
Temperature

Flexibility to Meet Your Needs

The Rosemount 3051SMV is the most versatile DP Flow product on the market. You specify the level of compensation to best match your application. Results are further improved by choosing the right primary element from our full line of flowmeters.

Stable liquids

Most stable liquids do not require the expense of line pressure and temperature compensation. The 3051SMV does the engineering for you – enter three parameters and we do the rest.

Liquids and saturated steam

Temperature compensation, which is important for mass measurement of liquids and saturated steam, is easily integrated in the 3051SMV.

Saturated steam

Pressure compensated mass flow is common for saturated steam applications when line pressure is also monitored, e.g. preventing overpressure in the boiler. The SuperModule platform provides integration of line pressure measurement without the expense of adding a separate device.

Gas, natural gas, and steam

Achieve the highest level of performance in gas, natural gas, and steam applications. The SuperModule platform integrates high performance pressure and temperature measurement to simplify installation and reduce cost. Real-time fully compensated mass flow reduces variability and improves profitability.

The key to our performance…

The SuperModule® platform

Rosemount 3051SMV delivers cutting edge performance and capabilities with the SuperModule Platform. Patented Saturn™ sensing technology delivers the highest level of perfomance. The all-welded, hermetically sealed SST design ensures the highest level of reliability.

- Industry's first %-of-reading specification delivering 10x performance improvement
- Industry's first 10-year stability backed by a 12-year limited warranty
- SuperModule temperature measurement for diagnostics
- Additional gage or absolute pressure sensor in the MultiVariable platform

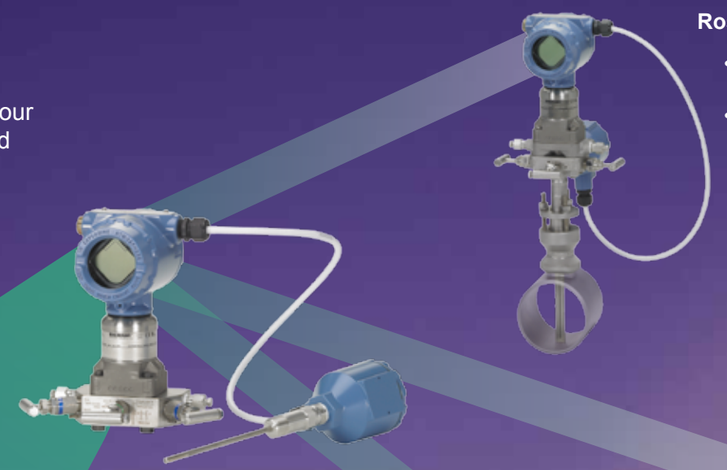
High performance temperature measurement

Process temperature is a critical process variable to mass and energy flow. The 3051SMV MultiVariable Transmitter incorporates best-in-class performance and capability.

- Sensor matching using Callendar-Van Dusen constants
- User-specified temperature limits
- User-specified temperature backup
- Easy installation with industry standard RTD cable

Optimize Results.
Complete Your Measurement.

A flow transmitter is only half the story. To achieve the highest accuracy for your measurement point, the right primary element must be chosen and integrated with the transmitter. Ten devices traditionally required for mass flow measurement are replaced with one 3051SMV flowmeter. A flow computer or control system is no longer required to calculate mass flow. This reduces engineering time, DCS processor load and improves response time. An integrated Rosemount flowmeter will optimize your loop performance, minimize material costs, lower engineering, design, procurement and installed costs, and minimize potential leak points.



Rosemount 3051SFA Probar Flowmeter

- Realize energy savings through minimal permanent pressure loss
- Reduce installed cost for large line sizes with a single pipe penetration

Rosemount 3051SFC Compact Orifice Flowmeter

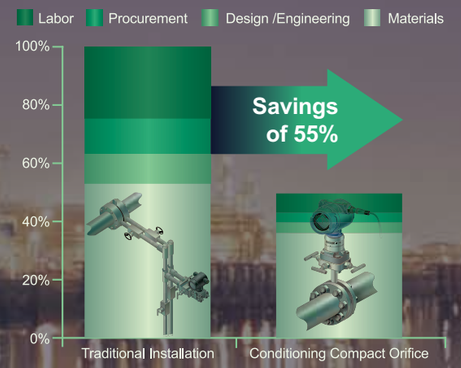
- Reduce installed cost compared to a traditional orifice plate
- Minimize straight-run requirement with conditioning technology

Rosemount 3051SFP Integral Orifice Flowmeter

- Improved accuracy in small lines
- Self-centering orifice plate
- Precision-honed pipe section

What could you do with 55% more manpower?

Rosemount integrated flowmeters come fully configured, leak-tested and ready to install, right out of the box. That means more time for results-oriented proactive activities.



For information on how to optimize your measurement, go to www.rosemount.com/3051S.

ROSEMOUNT 3051S SERIES OF INSTRUMENTATION

For more information about 3051S, view these documents online at Rosemount.com

Rosemount Measurement Technologies
00803-0100-6114

Smart Wireless Field Network Solutions
00803-0100-6129

Rosemount 3051S Series
00803-0100-6092

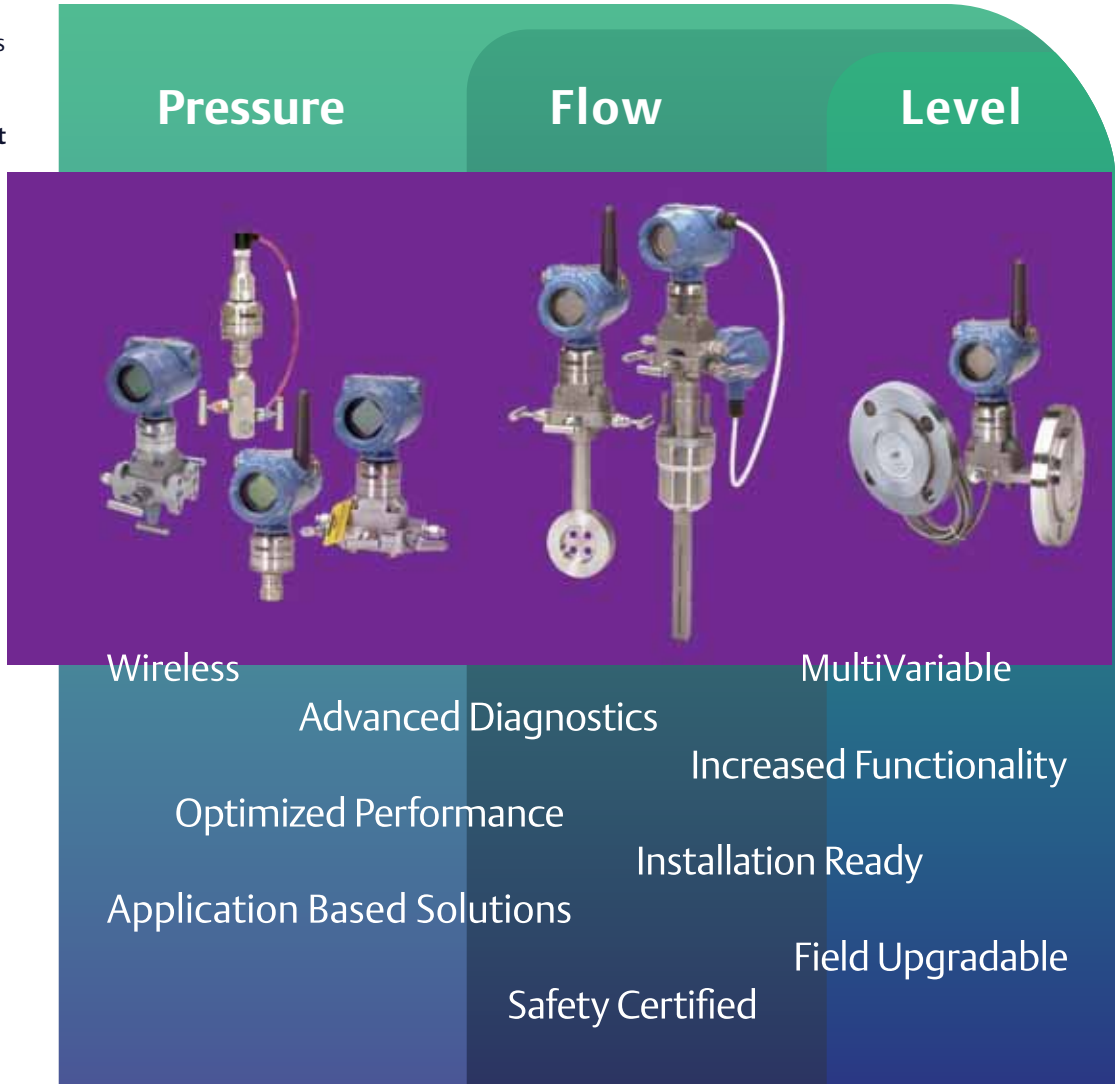
Rosemount 3051S Advanced Diagnostics
00803-0200-4801

Rosemount Annubar Series DP Flow
00803-0100-6113

Rosemount Orifice Series DP Flow
00803-0100-6115

Rosemount DP Level
00803-0100-6083

Rosemount Safety Instrumented Systems
00803-0100-6127



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